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SEP 06 2006

## IN THE CLAIMS:

1. (Currently amended) A cooktop, comprising a gas burner, a dual function gas valve, a user interface, an electronic controller, an igniter, and a flame sensor, wherein said electronic controller is connected to said dual function gas valve to control gas flow to said gas burner, wherein said user interface is for user entry of burner heating level for said gas burner, wherein said electronic controller is operative to control said dual function gas valve in accordance with said user entry, ~~wherein said igniter is connected to ensure ignition of gas delivered to said gas burner;~~ wherein said flame sensor is connected and placed to monitor for presence of flames at said gas burner, wherein said dual function gas valve includes a first mechanism to operate in a first electronically controlled mode and a second mechanism to operate in a second electronically controlled mode, said first mode providing a continuous flame at said gas burner modulated to a predetermined lower first heating level or to a predetermined higher second heating level, and said second mode providing intermittent flame at said gas burner for producing heating levels less than said lower first heating level for simmering operation, said igniter connected to ensure reignition of the gas delivered to said gas burner when said dual function gas valve is operating in said second electronically controlled mode.
2. (original) A cooktop as in claim 1, wherein said user interface comprises one or more touch-sensitive pads.
3. (Currently amended) A cooktop as in claim 1, further comprising a plurality of gas burners, one said dual function gas valve for each said gas burner, wherein each of said gas valves includes a proportionally controlled solenoid-operated modulating gas valve, wherein ~~no gas flow condition is measured~~ flows in its fully closed position.

4. (Currently amended) A cooktop as in claim 3, wherein each of said dual function gas valves comprises a proportionally controlled solenoid-operated modulating gas valve wherein maximum gas flow is measured flows in its fully open position.
5. (Previously presented) A cooktop as in claim 4, wherein each of said dual function gas valves is also capable of providing any intermediate controlled position.
6. (original) A cooktop as in claim 1, wherein said user interface comprises a multiplicity of touch-sensitive pads operable to select burner heating levels in a predetermined set of user-selectable steps.
7. (Previously presented) A cooktop as in claim 6, wherein a lowest portion of said user-selectable steps corresponds to a flame "on/off" sequencing mode of flow settings of said dual function gas valve.
8. (Previously presented) A cooktop as in claim 6, wherein a highest portion of said user-selectable steps corresponds to a continuous flame modulation mode of flow settings of said dual function gas valve.
9. (Previously presented) A cooktop as in claim 6, wherein each of said user-selectable steps corresponds to one of a multiplicity of flow settings of said dual function gas valve in a predetermined range .

10. (Previously presented) A cooktop as in claim 2, wherein said user interface further comprises a visual interface including a display selected from the list consisting of:

- a) seven-segment LED displays;
- b) discrete LED displays;
- c) bar-graph LED displays;
- d) LCD displays;
- e) vacuum fluorescent displays; and
- f) field-emission displays.

11. (Previously presented) A cooktop as in claim 2, wherein said user interface further comprises an audible interface including an annunciator selected from the list consisting of:

- a) an external drive piezo-acoustic element;
- b) a built-in drive piezo-acoustic element;
- c) an external drive magnetic transducer;
- d) a built-in drive magnetic transducer;
- e) an external drive speaker; and
- f) a built-in drive speaker.

12. (original) A cooktop as in claim 1, wherein said igniter comprises a resistive hot-surface igniter.

13. (Currently amended) A cooktop, comprising:

- a) a gas burner ;
- b) a dual function gas valve connected to control gas flow to said gas burner wherein said dual function gas valve includes a first mechanism to operate in a first electronically controlled mode and a second mechanism to operate in a second electronically controlled mode, said first mode providing a continuous flame at said gas burner modulated to a predetermined lower first heating level or to a higher second heating level, and said second mode providing intermittent flame at said gas burner for producing heating levels less than said lower first heating level for simmering operation;
- c) a user interface for user entry of burner heating level for said gas burner, wherein said user interface comprises a multiplicity of touch-sensitive pads operable to select burner heating levels in a predetermined set of user-selectable steps and wherein a lowest portion of burner heating levels corresponds to a flame "on/off" sequencing mode of flow settings of said dual function gas valve;
- d) a controller operative to control said dual function gas valve in accordance with said user entry;
- e) an igniter connected to ensure ignition reignition of the gas delivered to said gas burner when said dual function gas valve is operating in said second electronically controlled mode; and
- f) a flame sensor connected and placed to monitor the presence of flames at said gas burner.

14. Canceled
15. (Currently amended) A cooktop as in claim 13, wherein said gas valve comprises a proportionally controlled solenoid-operated modulating gas valve wherein no gas ~~flow condition is measured~~ flows in its fully closed position.
16. (Currently amended) A cooktop as in claim 13, wherein said gas valve comprises a proportionally controlled solenoid-operated modulating gas valve wherein maximum gas ~~flow is measured~~ flows in its fully open position.
17. (Previously presented) A cooktop as in either of claims 15 and 16, wherein said gas valve comprises a proportionally controlled solenoid-operated modulating gas valve is also capable of providing any intermediate controlled position.
18. Canceled
19. Canceled
20. (Previously presented) A cooktop as in claim 13, wherein a highest portion of said user-selectable steps corresponds to a continuous flame modulation mode of flow settings of said dual function gas valve.
21. (Previously presented) A cooktop as in claim 13, wherein each of said user-selectable steps corresponds to one of a multiplicity of flow settings of said dual function gas valve in a predetermined range .

22. (Previously presented) A cooktop as in claim 13, wherein said user interface further comprises a visual interface including a display selected from the list consisting of:
  - a) seven-segment LED displays;
  - b) discrete LED displays[.];
  - c) bar-graph LED displays;
  - d) LCD displays;
  - e) vacuum fluorescent displays; and
  - f) field-emission displays.
23. (Previously presented) A cooktop as in claim 13, wherein said user interface further comprises an audible interface including an annunciator selected from the list consisting of:
  - a) an external drive piezo-acoustic element;
  - b) a built-in drive piezo-acoustic element;
  - c) an external drive magnetic transducer;
  - d) a built-in drive magnetic transducer;
  - e) an external drive speaker; and
  - f) a built-in drive speaker.
24. (original) A cooktop as in claim 13, wherein said igniter comprises a resistive hot-surface igniter.

25. (Previously presented) A heating device, comprising:

a gas burner;

a single dual function valve including both a first electronically controlled mechanism and a second electronically controlled mechanism within said single dual function valve, said single dual function valve connected to provide gas to said gas burner;

an electronic controller for electronically controlling said first electronically controlled mechanism and said second electronically controlled mechanism;

said first electronically controlled mechanism capable of providing at least two different on-levels of continuous gas flow to said gas burner; and

said second electronically controlled mechanism capable of stopping and starting flow of gas to said gas burner, wherein combination of said first electronically controlled mechanism and said second electronically controlled mechanism provides capability to achieve a lower temperature than is achievable with just continuous flow of gas from said first electronically controlled mechanism.

26. (Previously presented) A heating device as recited in claim 25, wherein said first electronically controlled mechanism is capable of providing 30 different on-levels of gas flow.



27. (Previously presented) A heating device as recited in claim 25, wherein said gas burner is capable of providing a flame, wherein said electronic controller is capable of controlling said second mechanism for sequencing the flame on and off at a predetermined level of flame.
28. (Previously presented) A heating device as recited in claim 27, wherein said controller comprises a microcontroller, wherein sequencing the flame on and off is controlled by said microcontroller.
29. (Previously presented) A heating device as recited in claim 28, wherein said microcontroller further comprises a pulse width modulation output port and an A/D converter.
30. (Previously presented) A heating device as recited in claim 27, wherein sequencing the flame on and off is controlled by time.
31. (Previously presented) A heating device as recited in claim 27, wherein sequencing the flame on and off is accomplished with the on level set to a predetermined medium level of flame or with the on level set to a medium-low level of BTU output.
32. (Previously presented) A heating device as recited in claim 27, wherein sequencing the flame on and off is accomplished with gas flow on and off for time periods to correspond to a desired simmer level.
33. (Previously presented) A heating device as recited in claim 25, wherein said controller uses pulse-width-modulation for controlling said first mechanism.
34. (Previously presented) A heating device as recited in claim 25, further comprising an igniter, wherein said igniter assures re-ignition of said gas when said second mechanism is used.

35. (Previously presented) A heating device as recited in claim 34, wherein said igniter does not need to be synchronized with on/off cycling of said flow of gas during simmer mode
36. (Previously presented) A heating device as recited in claim 35, wherein said igniter is continuously powered when said second mechanism is used.
37. (Previously presented) A heating device as recited in claim 34, wherein said igniter comprises a resistive hot-surface igniter.
38. (Previously presented) A heating device as recited in claim 37, wherein said igniter comprises a ceramic hot-surface igniter capable of constant re-ignition
39. (Previously presented) A heating device as recited in claim 25, further comprising a main in-line solenoid safety valve.
40. (Previously presented) A heating device as recited in claim 25, further comprising a plurality of gas burners and a plurality of said dual function valves, wherein each of said plurality of gas burners has one of said plurality of dual function valves connected to provide gas .
41. (Previously presented) A heating device as recited in claim 25, wherein said first mechanism comprises a variable orifice solenoid that has a plurality of positions controlled by application of a voltage signal.
42. Cancel

43. (Previously presented) A heating device as recited in claim 25, further comprising an igniter for igniting gas when said first electronically controlled mechanism provides flow of gas.
44. (Previously presented) A heating device as recited in claim 43, wherein said igniter is a hot-surface igniter.
45. (Previously presented) A heating device as recited in claim 43, further comprising an igniter for igniting gas when said first electronically controlled mechanism and said second electronically controlled mechanism provides flow of gas.
46. (Previously presented) A heating device as recited in claim 45, wherein said igniter is set to be on continuously when said second electronically controlled mechanism is being used to stop and start flow of gas to said gas burner.
47. (Previously presented) A heating device as recited in claim 43, further comprising a circuit to monitor ignition, said circuit including a sensor for sensing at least one from the group consisting of flame and current flowing in said igniter.
48. (Previously presented) A heating device as recited in claim 25, further comprising a user interface.
49. (Previously presented) A heating device as recited in claim 48, wherein said user interface comprises a dial control.
50. (Previously presented) A heating device as recited in claim 48, wherein said user interface comprises touch switches.

51. (Previously presented) A heating device as recited in claim 50, wherein said touch switches comprises a touch pad.
52. (Previously presented) A heating device as recited in claim 48, wherein said user interface comprises a capacitive touch keyboard.
53. (Previously presented) A heating device as recited in claim 48, wherein said user interface comprises a power key, an on key, power level control keys, and an off key.
54. (Previously presented) A heating device as recited in claim 25, further comprising a digital visual display of cooking level of each said gas burner.
55. (Previously presented) A heating device as recited in claim 54, wherein said digital visual display comprises an LED, LCD, or a vacuum fluorescent display
56. (Previously presented) A heating device as recited in claim 25, further comprising a burner base and a flame sensor fixed to said burner base.
57. (Previously presented) A heating device as recited in claim 56, further comprising an igniter and a circuit to detect current flowing in said igniter, wherein if no current flows in said igniter during an ignition period or no flame is sensed then visual and audible alarms are generated.
- 58-60 canceled
61. (Previously presented) A heating device as recited in claim 25, further comprising a main in-line valve for closing off flow if a fault condition occurs.
62. (Previously presented) A heating device as recited in claim 61, further comprising an igniter, wherein said igniter is de-energized if a fault condition occurs.

63. (Previously presented) A cooktop as in claim 13, further comprising a main in-line solenoid safety valve.

64. (Currently amended) A device for controlling flow of a fluid, comprising:

a dual function valve including both a first electronically controlled mechanism and a second electronically controlled mechanism;

an electronic controller for electronically controlling said first electronically controlled mechanism and said second electronically controlled mechanism;

said first electronically controlled mechanism capable of providing at least two different on-levels of continuous fluid flow; and

said second electronically controlled mechanism capable of continuously being sequenced between allowing fluid flow on and sealed off to prevent fluid flow thereby providing ~~provide~~ an intermittent flow of fluid, wherein said second electronically controlled mechanism is set to allow flow for a fraction of time and is otherwise set to be sealed off, wherein overall flow is proportional to said fraction.

65. (Previously presented) A device as recited in claim 64, wherein said fluid comprises gas.
66. (Previously presented) A device as recited in claim 65, wherein said first electronically controlled mechanism is capable of providing any intermediate level of gas flow.
67. (Previously presented) A device as recited in claim 65, wherein said first electronically controlled mechanism is capable of providing 30 different on-levels of gas flow.

68. (Previously presented) A device as recited in claim 65, wherein said electronic controller is capable of controlling said second mechanism for sequencing flow on and off at a predetermined level.
69. (Previously presented) A device as recited in claim 68, wherein said controller comprises a microcontroller, wherein sequencing fluid flow on and off is controlled by said microcontroller.
70. (Previously presented) A device as recited in claim 69, wherein said microcontroller further comprises a pulse width modulation output port and an A/D converter.
71. (Previously presented) A device as recited in claim 68, wherein sequencing the flow on and off is controlled by time.
72. (Previously presented) A device as recited in claim 68, wherein sequencing the flow on and off is accomplished with the on level set to a medium-low level.
73. (Previously presented) A device as recited in claim 68, wherein sequencing the flow on and off is accomplished with gas flow on for 1 second and off for 8 seconds.
74. (Previously presented) A device as recited in claim 64, wherein said controller uses pulse-width-modulation for controlling said first mechanism.
75. (Previously presented) A device as recited in claim 64, further comprising a main in-line solenoid safety valve.
76. (Previously presented) A device as recited in claim 64, wherein said first mechanism comprises a variable orifice solenoid that has a plurality of positions controlled by application of a voltage signal.

77. (Previously presented) A device as recited in claim 64, wherein said fluid comprises gas and wherein a single gas valve includes both said first electronically controlled mechanism and said second electronically controlled mechanism.
78. (Previously presented) A device as recited in claim 64, further comprising a user interface.
79. (Previously presented) A device as recited in claim 78, wherein said user interface comprises a dial control.
80. (Previously presented) A device as recited in claim 78, wherein said user interface comprises touch switches.
81. (Previously presented) A device as recited in claim 80, wherein said touch switches comprises a touch pad.
82. (Previously presented) A device as recited in claim 78, wherein said user interface comprises a capacitive touch keyboard.
83. (Previously presented) A device as recited in claim 78, wherein said user interface comprises a power key, an on key, power level control keys, and an off key.
84. (Previously presented) A device as recited in claim 64, further comprising a digital visual display of flow.
85. (Previously presented) A device as recited in claim 84, wherein said digital visual display comprises an LED, LCD, or a vacuum fluorescent display.